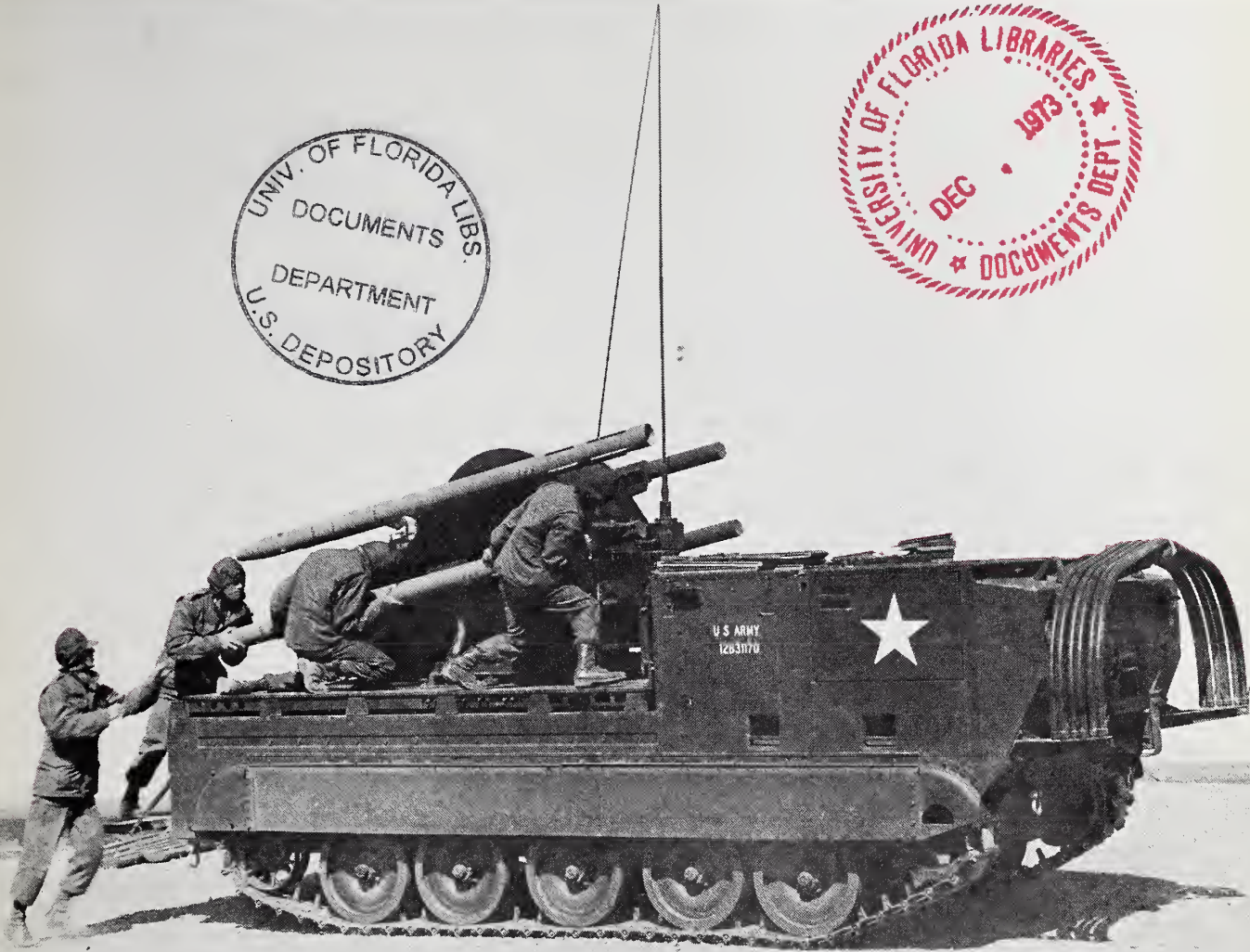
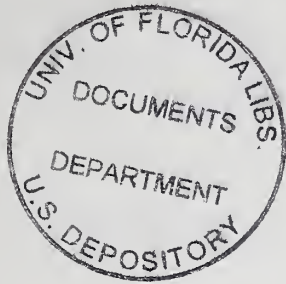


D101.22/3: 385-115

# AMC SAFETY DIGEST

AMCP 385-115



OCTOBER 1973



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**DEPARTMENT OF THE ARMY**  
**HEADQUARTERS, UNITED STATES ARMY MATERIEL COMMAND**  
**5001 Eisenhower Ave. Alexandria, VA 22304**

AMC PAMPHLET  
NO. 385-115

OCTOBER 1973

The Safety Digest is an AMC Pamphlet prepared by the Safety Office, Headquarters, US Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all command establishments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

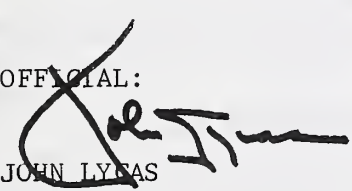
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Unclassified material believed to be of interest or benefit to other establishments is welcome for publication in the Safety Digest. Please send articles for review to: US Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

(AMCSF)

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Special Distribution



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**October 1973**

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# ANALYSIS OF AMC FALL ACCIDENTS, FY 1968 - FY 1972

Raymond J. Fatz, Safety Specialist  
Fort Sill, Oklahoma

The well-practiced fall of a circus clown is rather comical in the eyes of the audience, but there is no levity in real-life situations where unplanned falls take their toll. In fact, falls continue to be the nation's second leading cause of accidental death.

If, when you fall, you find that all you injure is your pride, consider yourself lucky. Each year an estimated one million Americans fall and damage a great deal more than their dignity. Although falls through gaping holes or from high elevations claim their occasional victims with dramatic headlines, the more ordinary things of life such as stairs, waxed floors and electrical cords may be more dangerous statistically.

The following information concerning falls was extracted from AMC accident report files over the five-year period of FY 1968 through FY 1972 in order to measure the seriousness of falls throughout the command:

1. There were 570 disabling injuries caused by falls. Several of this total were permanent injuries and four were fatalities.

2. Falls have accounted for 22 per cent of all injuries during this time frame.

3. Falls on the same level (322) were more frequent than falls at different levels (248).

4. Seventy per cent of the falls were incurred by males. This is less than the over-all figure of 85 per cent for males in all injury categories.

5. Sixty-four per cent of those injured by falls were 41 years of age or older.

6. The most common days for falls were Monday and Tuesday, 118 and 119, respectively. Falls occurred at a higher frequency during the winter months.

7. The midmorning hours of 10-11 find falls reaching their peak; however, over 22 per cent of the injury-producing falls occurred during the first and last hours of continuous duty.

8. One-fourth of the falls occurred in work areas.

9. Twenty per cent of the falls had slippery surfaces as agencies.

There is no time better than the present to begin a concerted drive toward fall prevention. The mishaps must be examined closely on an individual basis to isolate specific causes for correction. Comments such as the following may be applicable to some AMC installations and activities in their efforts to reduce the frequency of falls.

1. An office safety program should be vigorously pursued. AMC accident experience reveals that women are victims of office falls more often than men, and one-third of the office falls involved chairs as causal agencies. Far too many people hold the blind belief that office injuries are inconsequential. This complacency must be removed and replaced with constant awareness toward office hazards and their potential. Safe work practices and office layout must be optimized.

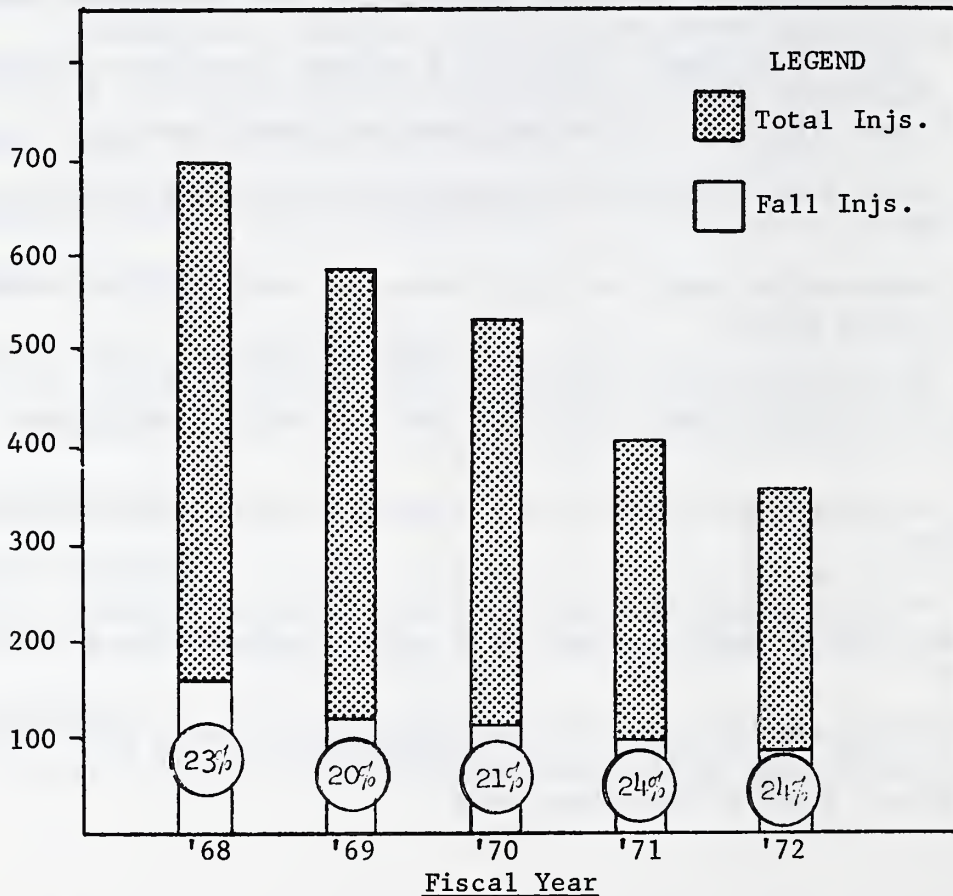


Figure 1. AMC Fall Injuries as a Percentage of Total AMC Injuries.

2. Many factors contribute to falls, but one in particular stands out statistically -- slipperiness underfoot. Proper selection and maintenance of flooring is a good start yet the best of such slip-free floorings can become totally ineffective where poor housekeeping thrives. Anyone who works out-of-doors is occasionally exposed to slippery surfaces. Although you cannot control the weather, you can establish a program whereby snow and ice hazards are quickly removed or substantially reduced.

3. Stairs present a somewhat different problem as far as corrective action is concerned. Analysis of AMC slips, trips and falls on stairways indicates unsafe acts of persons prevailing far more often than unsafe conditions. A well-lighted, properly constructed stairway can be perilous to runners, "two-steps-at-a-timers" and handrail abstainers.

4. Falls from ladders, scaffolds and other elevated locations usually result in injuries of extreme severity. This senseless pain is quite often precipitated by use of improper equipment without regard for hazard potential; e.g., makeshift work platforms on forklifts. Typical ladder incidents describe workers overreaching from unanchored ladders.

5. Many people become victims to falls under seemingly safe circumstances. These falls present the indisputable fact that greater care is necessary in performing the simple act of walking. Any type of distraction, even momentarily, reduces the worker's alertness and increases

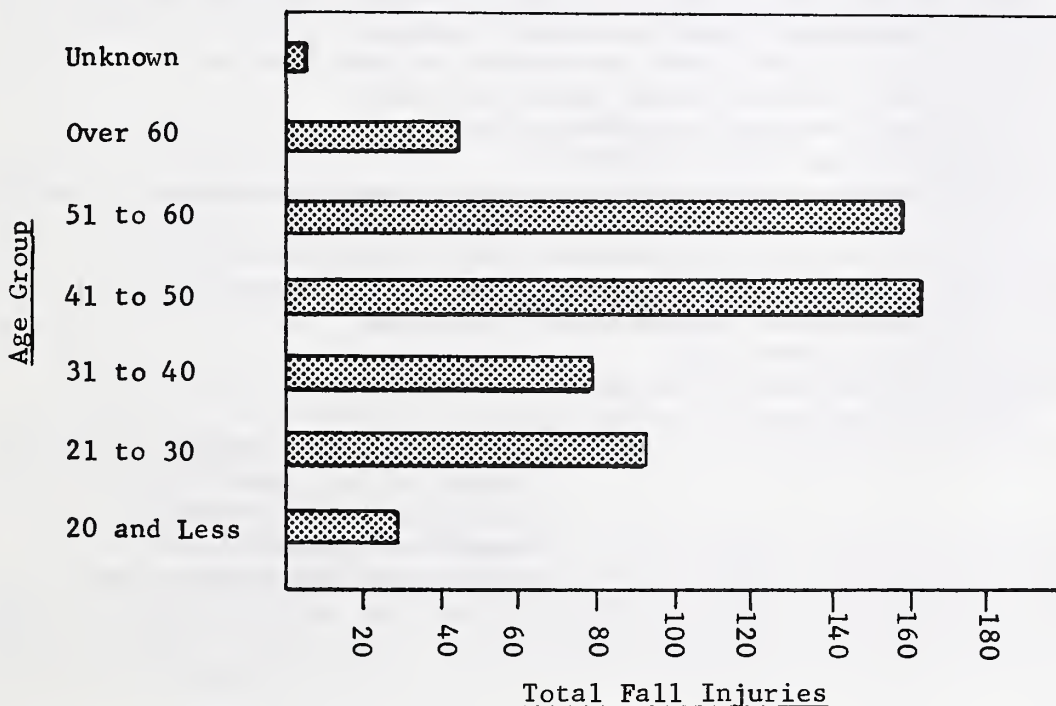


Figure 2. AMC Fall Injuries by Age Group, FY 1968 - FY 1972

the probability of a fall. No two people walk in exactly the same way. Care in walking is an accommodation peculiar to each person's stride, balance, and manner of carrying the body. For this reason one must adjust to one's own style of walking to cope with potential obstacles.

6. As silly as it might sound, it would behoove people to learn to fall safely. Such conditioned reflexes can be learned under the supervision of a competent physical educator. Knowing the art of falling can eliminate or substantially reduce the severity of injuries.

\*\*\*\*\*

## WHAT SAFE DRIVING MEANS

Watching out for children at play

Having your vehicle under complete control at all times

Always being alert for the actions of other drivers

Trying brakes, lights and horn before leaving

Seeing that all accessories are in safe operating condition

Acquiring sufficient rest and sleep to prevent fatigue

Forming safe courteous driving habits

Eliminating that urge to beat the light change

Driving defensively at all times

Respecting stop signs and signals as safety measures

Insisting upon proper repairs and adjustments to your vehicle

Viewing the roadway through a clear clean windshield

Ignoring hitchhikers or other unauthorized riders

Never insisting upon the right of way

Giving pedestrians the opportunity to complete crossings safely

Making certain of clearance to the rear before backing

Estimating safe distances before passing

Announcing your intentions through proper signaling

Never overdriving your headlights

Staying safely back of the car ahead.

- Safety Report and Safety Topic  
Pamphlet, May 1973  
Thiokol Chemical Corporation,  
Longhorn Division  
Longhorn Army Ammunition Plant



# ABOVE THE CREST

John C. Neamtz, DAC  
Flight Operations and Aviation Safety  
New Cumberland Army Depot

INTRODUCTION: Tropical Storm Agnes moved into the Central Pennsylvania Area on 21 June 1972, and in a 24 hour period the area received approximately 15 inches of rainfall. As a result of flooding, only about 15% of the normal work force would report for work at New Cumberland Army Depot.

The motto of all aviators is "Above the Best" and in this case it was also "Above the Crest" of the raging Susquehanna River and its tributaries.

I awakened early the morning of 22 June 1972 with the rain being driven against the aluminum siding of my home by a 30-40 mile per hour wind. I knew immediately something very unusual was happening and I was soon to find out.

I hurriedly dressed and left for work, although it was nearly an hour earlier than usual. Ten minutes later I found the access road to New Cumberland Army Depot closed by flooding water, and it was necessary to backtrack several miles to reach the only access road to the Depot. This access road was closed by rising water 2 hours later.

I arrived at Flight Operations at 0700, to find we had only a skeleton work force. At 0705 I received our first call for help, to rescue 60 Girl Scouts from a camp near Dover, PA. At this time, I could only man two CH-47 helicopters due to non-availability of pilots. Three of our pilots who lived in government quarters on depot, were being flooded themselves, and were trying to care for their families and personal effects.

I called the Commander at his quarters for permission to dispatch a helicopter. He could not be contacted for 10 minutes, as he was out in the depot's open storage area checking the flooding condition of the storage area.

The first helicopter was launched at 0715 hours, and the nightmare began. Missions of the "Life or Death" type came so fast and furious, the Operations Sergeant and myself hardly had time to write them down and brief the flight crews. Little did I know that I would not get home for six days.

Although twelve CH-47 helicopters were available in flyable condition, our immediate problems were aircrews to fly them and fuel.

Fortunately, four complete CH-47 crews from the 154th Aviation Co., Ft Sill, Oklahoma, and two complete crews from the 196th Aviation Co., Ft Bragg, North Carolina, were TDY to New Cumberland Army Depot. These crews, all RVN returnees, were pressed into service with concurrence of CONARC. JP-4 fuel was ordered from DSA supply point in New Jersey.

However, the last remaining access road to the depot had been closed by the time it arrived, necessitating a fueling point being set up at Indiantown Gap Military Reservation, some 20 miles away. In this manner we were able to operate nine CH-47 aircraft during the flood plus thirteen additional helicopters which were attached to New Cumberland Army Depot for operational control during the emergency.

Initially, missions were received from the Pennsylvania State Police, both by phone and radio. After the first 36 hours, the Office of Emergency Preparedness (OEP) Control Center was established as a result of the President declaring Mid-State Pennsylvania a disaster area, and all flight missions were received from this office for remainder of the emergency.

The river finally crested at Harrisburg, Pennsylvania (adjacent to New Cumberland Army Depot) on Saturday afternoon, June 24th at 35 feet, nearly 20 feet above flood stage.

The Flight Operations section was operated each day from 0600 to 2130 hours and in a five day period aircraft from New Cumberland Army Depot flew over 200 missions, flying over 500 hours. Many of these missions included more than one assignment, as aircraft were diverted while on one mission to accomplish another. In accomplishing these missions, over 3500 personnel and 150,000 pounds of cargo were transported.

All missions were performed without accident or incident even though the aircrews were subjected to a higher than normal degree of exposure, due to long hours, hazardous terrain, very adverse weather (high winds, rain, minimum ceilings and poor visibility).

On Sunday, 25 June, a chlorine gas leak developed in New Cumberland, Pennsylvania, adjacent to the depot. I received a call from the Aviation Officer, who had returned from leave since the flood began, alerting me that a mass evacuation of the depot by helicopter might be required, and to hold all CH-47 assets until he called. There were nine CH-47's and one UH-1 available. I assigned crews, radio frequencies, and held a hasty briefing of the pickup and landing sites. Within 10 minutes the Aviation Officer called back with orders to evacuate all personnel from New Cumberland Army Depot to Mechanicsburg Naval Depot. Within 25 minutes, 800 personnel had been airlifted to Mechanicsburg Depot, a distance of 7 miles.

Due to the rapid rise of the waters on the night of 22 June, eight CH-47 aircraft in storage in the maintenance area were reached by the flood waters. Flight crews from the transient personnel and this writer waded through water  $4\frac{1}{2}$  feet deep to reach the aircraft at 0600 hours 23 June.

All aircraft were evacuated to higher ground with no damage occurring other than a need to inspect these aircraft for a water landing.

It was a miracle so many people were saved, and this can be directly attributed to the skill of the Army and civilian pilots at New Cumberland Army Depot, and the transient crews from Ft Sill and Ft Bragg. They rescued more than 500 people in the most critical period of the flood disaster in the Central Pennsylvania Susquehanna River Basin with the CH-47's. The experience of these aircrews was the big reason for the accident free rescue success. Most were Vietnam veterans and they certainly knew how to stand up to a pressure situation. The devotion to duty and airmanship displayed by these men will long be remembered by the people of Central Pennsylvania, and reflected great credit to themselves, and the United States Army.

Yes, our Army aviators are not only "Above the Best" but were also "Above the Crest" of the raging Susquehanna in the Great Central Pennsylvania Flood of 1972.

# REMOVING FLAMMABLE VAPORS AND LIQUIDS FROM CONTAINERS

Malvin K. Wentzel  
Maintenance Directorate  
US Army Tank-Automotive Command

Editor's Note: Information from the field indicates that several Army installations and activities are cleaning containers with purging materials that have neither been tested nor approved for such use. The dangers inherent in maintenance operations on fuel containers, for example, make it imperative that only approved purging agents be used per TB 750-1047. For this reason, the following article which was published in the AMC Safety Digest, September 1963, is reprinted.

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For years the military services and industry have been cleaning and purging tanks containing flammable liquids and vapors by the time-honored and time-consuming method of steam cleaning, water rinsing, CO<sub>2</sub> purging and aeration.

Maintenance and safety personnel are dismayed whenever it becomes necessary to repair tanks that previously held flammable and explosive vapors. Precautions must be taken to prevent the possibility of setting off an explosion or an inferno. Many times, however, a careless worker has tried to cut the top off of a gasoline drum with a torch. Such acts often resulted in disasters.

In order to prevent fuel tank repair accidents, extensive safety precautions are taken; explosion meters are used to determine whether a repair or cutting operation can be done safely after the tank is "cleaned," and invariably the steam cleaning and water flushing must be repeated.

The US Army Tank-Automotive Command recommends the use of a commercial product that will eliminate the hazards associated with flammable and explosive vapors. It has been demonstrated that this product will render a 20-gallon gasoline tank safe for open flame welding in about 30 minutes, a saving of 2½ hours of time. Information is available in TB 750-1047/TO 36Y31-1-6. (Further details may be obtained from the Commander, TACOM, ATTN: AMSTA-CZ, Warren, MI 48090.)

This material has been used successfully both commercially and DOD-wide for over ten years in preparing fuel tanks for welding operations. It is an emulsifiable solvent combination with the following properties:



Specific Gravity: 1.456 @ 20°C.

Density: 12.13 lbs. per gal.

Flammability: Non-flammable

Toxicity Rating: 200 P.P.M. (M.A.C.)

Corrosiveness: Non-corrosive to metals

The product is both dependable and versatile. It will emulsify gasoline, diesel fuel or any hydrocarbon base liquid, thereby eliminating flammable vapor hazards.

When we think of a need for a purging agent, the first thing that comes to mind is gasoline tanks. But many other pipe lines, pump housings, distribution manifolds and reaction vessels are among these. In preparing these items for repair, one important thing is to assure that purging is done safely and that the material used to rid the equipment of flammable or explosive fumes is not, in itself, dangerous to use. Any product of this type should be submitted to local medical and safety personnel to ascertain the toxic hazards of the material. Personnel engaged in the purging operation should follow these few simple rules to safeguard their own lives, those of nearby workers and to prevent damage to equipment:

1. Do not begin the operation during an electrical storm or when one is threatening.
2. Do not wear wool, nylon, silk, rayon or other static electricity-generating clothing. Wear only clean cotton clothing, without metal buttons or fastenings.
3. Remove all contents from pockets because they might create a spark.
4. Use cotton waste for cleaning purposes. Other materials may generate static electricity and produce a spark.

#### Purging Operation

1. Statically ground the item or assembly by attaching a wire to a protruding bolt or bracket from which the paint has been scraped, and connecting the loose end to a water pipe or some other grounded object. (Be certain the object is grounded in accordance with paragraph 7-2, AMCR 385-100.)

2. Completely drain the assembly, tank, piping, pumps, meters, filters and segregators as applicable.
3. Remove all accessory items such as gages and floats in which explosive or combustibile liquid or vapor might be trapped.
4. Have the safety office or fire department take a combustibile vapor test reading.
5. Close or seal all drains.
6. Fill the container with cold water and let it overflow for five minutes. This will get rid of any excess flammable liquids because they will normally come to the top and overflow. But, here again, we must exercise caution so the flammable liquid is not dumped in an exposed drain pit.
7. Drain completely.
8. Close or seal all drains again.
9. For each 100-gallon tank/container capacity, add 40 fluid ounces of the chemical to the tank/container. (This is equivalent to 8 fluid ounces of the chemical for a 20-gallon fuel tank.) Caution: Once purging has begun, do not stop until process is complete.
10. Fill with cold water. Do not overflow.
11. Insert an air line into the container and agitate the solution with 3 to 5 psi of air for five minutes, continually moving the air line, assuring that baffle areas are agitated thoroughly. If the container is small, it may be agitated by shaking.
12. Remove the air line and drain the solution.
13. Seal all openings again.
14. Fill the container with cold water and overflow for another five minutes.
15. Drain the container completely.
16. Check the container with the tester to assure a negative reading.

Now the container is ready for welding, change of materials and/or storage. You can proceed with confidence if the preceding precautions were taken.

When an emergency exists, such as shortage of water, request for additional guidance should be directed to the Commander, US Army Tank-Automotive Command, ATTN: AMSTA-CZ, Warren, MI 48090.

The next issue of importance is the effect of the purging agent on the materials of which the tanks or containers are made. The agent should have no adverse or swelling action on any type of container. Some products may cause a swelling of rubber-lined containers when used. However, the recommended product will not adversely affect rubber if it is used according to directions (4 ounces to each 10-gallon capacity).

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## THIRTY WAYS TO GET HURT IN AN OFFICE

Many people have the feeling that an office is an ultrasafe place in which to work. What is there in an office short of falling down a flight of stairs, that can hurt a person?

Recently we reviewed a number of safety inspection reports that covered offices. We came up with the following list of items which had been written up. It should be interesting -- and beneficial -- to have each of your office supervisors check this list to see how many of these hazards exist in the areas they supervise. A potential for an injury exists in each of these unsafe conditions:

1. Typewriter not secured to the desk.
2. Desk chair with worn or broken casters (poor foundation).
3. Open desk drawers (tripping and bumping hazard).
4. File cabinets not firmly secured.
5. Heavy material stored in the top drawer of the file cabinet (tilting hazard).
6. Open file drawers (tripping and bumping hazard).
7. Obstructions in the aisle or walkway (tripping hazard).
8. Telephone cord across floor and not enclosed (tripping hazard).
9. Adding machine cord adrift on the floor (tripping and ankle-turning hazard).
10. Cords for electrical office machines and desk lights frayed, showing bare wires, spliced and taped, or otherwise indicating "do-it-yourself" repairs.

11. Loose and broken electrical receptacles and plugs (shock and fire hazard).
12. Empty soft drink bottles on desks, tables, window sills and floors (cutting hazard if accidentally broken).
13. Razor blade in pin or paper clip container.
14. Pencils -- with points up -- in a drinking glass (puncture wound hazard).
15. Cracked glass desk tops and tops with chipped edges.
16. Makeshift ashtrays near wastebaskets (fire hazard).
17. Stenographers chairs with improperly secured backs.
18. Sharp-edged metal fasteners on file folders.
19. Sharp-pointed scissors or shears, without protective covers in desk drawers.
20. Splintered and rough edges on wooden furniture.
21. Sharp edges on filing cabinet drawers or accessories.
22. Loose fans, lights, or other overhead fixtures.
23. Office machines too near the edge of the desk or table.
24. Bookcases not uniform, and unstable with no means of proper securing.
25. Broken or improperly operating office equipment.
26. Unauthorized and hazardous hot plate or coffee maker arrangements.
27. Protruding objects and sharp corners (bumping hazard).
28. Catching fingers in file or desk drawers.
29. Throwing paper clips or shooting rubber bands (horseplay).
30. Absentmindedness during paper-cutting operations.

This list of office hazards is taken from the reports of safety inspections made by safety personnel. Some of them may be existing in your offices. Inspection may turn up still others not on this list. The action to be taken if any hazards are found is the standard procedure for such a situation -- correct them.

- Safety Office,  
Aberdeen Proving Ground



# MODERN APPROACH TO OLD PROBLEMS

Safety Division  
Mason & Hanger-Silas Mason Co., Inc.  
Iowa Army Ammunition Plant

Electronic Data Processing (EDP) techniques are being utilized to tabulate and analyze accident experience at the Iowa Army Ammunition Plant (IAAP). The EDP improvement was planned, tested and implemented by Safety Division personnel with Mason & Hanger-Silas Mason Co., Inc., operators of IAAP, to provide plant management with prompt, accurate and effective information that can be used in a functional way to prevent accidents.

Monthly data runs are issued by the Safety Division to all Division Managers. Basic information is taken from Field Hospital first-aid reports and facts gathered in accident investigations by Safety personnel. The EDP print-outs are done from handwritten analysis sheets originating in the Safety office.

Each monthly report, issued to correspond with cut-off dates required to meet Department of the Army deadlines, includes the following:

Name and badge number of injured employee.

Department number and name of injured's responsible foreman or supervisor.

Sex, age, job title and current medical classification of injured. (Include duty restrictions if any due to physical impairment.)

Date of injury and shift assignment.

Severity of injury: First-aid case, doctor case, serious injury, workmen's compensation case, permanent disability or fatal injury.

Accident type (fall, struck by object, etc.), injury type (contusion, fracture, etc.) and part of body affected.

Cost figures: \$20 for first aid, \$25 for doctor case, \$35 for serious injury involving change in assignment, and appropriate estimates for accidents resulting in workmen's compensation payments or other off-post expense.

The cost estimates, outlined in a detailed instruction booklet prepared for management personnel, are based on established Army guidelines and practical experience gained by the Safety Division while perfecting

the EDP procedure. During 1970 through 1972, it was pointed out to management that injury costs at IAAP totaled an estimated \$220,010 in unnecessary overhead.

Management is being encouraged to employ the monthly EDP reports, and summaries to be issued on at least an annual basis, by disseminating the print-outs to lower echelon supervision. It is hoped -- and actually anticipated -- that accident costs will be diminished as causes and frequency rates are (1) clearly defined by the Safety Department; and (2) reviewed and analyzed from the comprehensive, yet concise, EDP print-outs and accompanying narrative reports.

Use of the EDP procedure gives IAAP top management a clear-cut "handle" on accident accountability for the first time.

In the past, the Safety Division categorized monthly accident experience by Division. Any detailed breakdown had to be accomplished by Divisional office personnel or by the Safety Division on a request basis. There was no assurance that accident statistics were being utilized to potential advantage. Under the EDP analysis system, a monthly tally is maintained on the number and type of injuries occurring to employees under each foreman's supervision. All foremen can now be held accountable for accident prevention as well as production, attendance, utilization of material and other significant elements of their jobs.

Safety Division personnel will run studies on frequency and severity rates -- and accident causes and costs -- to determine if accident prevention trends improve next year and in years beyond. Yearly or quarterly summaries will provide reliable data on the cost per accident ratio of injuries per man-hours worked in comparable periods.

The EDP method of compiling and distributing injury statistics is expected to be a productive accident prevention tool when fully implemented as an integral part of IAAP operations with top management's backing. It is readily adaptable for a variety of special accident prevention studies. EDP accident statistics, to boil it down to a few words, are a realistic, modern approach toward solution of a challenging, contemporary problem.

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## SPARK OF DISASTER

The individual who studies reports of explosions soon becomes familiar with one comment that often appears in them. It is likely to appear in the following words and sequence in the list of causes for this type of accident:

"Investigation revealed the following possible cause of the explosion - static electricity."

Many AMC installations manufacture, handle, and store materials that a spark may cause to explode. If loss of life and property is to be avoided, adequate measures must be taken to prevent the static sparks that can cause disaster.

Whether we have few or many years of experience working with explosives, it is essential that we remain keenly aware of just what static is and what measures we must take to prevent it from causing an unwanted explosion.

Static electricity, as the name indicates, is the accumulated charge of electricity on the surface of a nonconductive material. This electrification is caused by migration of electrons across the interface between dissimilar materials that come into contact with each other. If one or both of the materials are nonconductors, the new distribution of electrons probably will persist when the materials are separated. The hazard of static electricity lies in the accumulation of charges and their eventual discharge in the form of a spark.

The three basic means of preventing the accumulation of static electricity are humidification, ionization, and bonding and grounding.

The bonding and grounding method is generally used by AMC installations. Methods and procedures for bonding and grounding of equipment are summarized in Section 7, AMCR 385-100.



If bonding and grounding are to be used successfully as a means of dissipation, it is necessary that certain facts be understood:

1. The mere physical connection to a ground is not necessarily sufficient to dissipate static charges. Connections must provide electrically continuous, low-resistance paths to ground.

2. Bonding and grounding conductors must be of sufficient size to provide required electrical conductivity and mechanical strength.

3. Connections to equipment and ground must be strong and insure good electrical contact.

4. The grounding (earthing) of two pieces of equipment in close proximity by means of separate ground conductors does not in all cases eliminate the static hazard. In such cases, a difference of electrical potential can exist and a static spark can occur. To eliminate this difference of potential, all bodies in close proximity must be electrically interconnected or "bonded."

Precautions that can be taken to prevent static caused explosions include the following:

1. Avoid the use of nonconductive material such as plastics, nylon, etc.

2. Bond and ground all static producing objects.

3. Make sure that grounds and bonds are both physically and electrically adequate.

4. Test all grounds and bonds upon installation and periodically thereafter.

5. Connect all machinery and equipment to a common ground to avoid differences of potential.

6. All pieces of piping such as exhaust systems and collection ducts must be bonded together. Physical connection of the pipes or ducts does not necessarily mean the system is bonded.

7. Assure that all grounds are adequate and meet the requirements of AMCR 385-100.

Control of explosions caused by static discharges can be accomplished by use of the measures herein and by using the techniques described in the National Fire Protection Association Pamphlet No. 77, "Static Electricity," and other approved standards for bonding and grounding.



# RETRACTABLE APPLIANCE CORDS

Gene C. Falck, Safety Engineer  
Olin Corporation  
Badger Army Ammunition Plant

Appliance cord reels for such items as vacuum cleaners, portable dish washers, etc., can be hazardous. If properly designed, however, this convenience for portable electric appliances does not present the hazard of a short length of electrical wiring repeatedly twisting and untwisting every time the cord is extended or allowed to rewind.

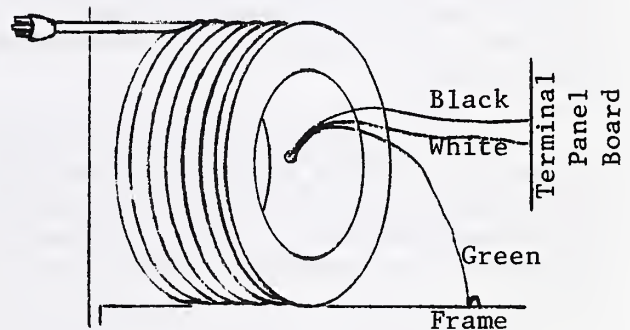
On the other hand, some of these cord reels are of very simple design as illustrated below. In such cases, the two power wires and the green safety ground wire lead directly from inside the reel to a stationary connection a few inches away. These wires will eventually fray or break off from twisting and flexing as the cord is unreeled or rewound.

When this happens, one of the following events can be expected to occur:

1. One or both power wires break, touching nothing, so the machine does not operate; the expected consequence is only a minor repair bill.

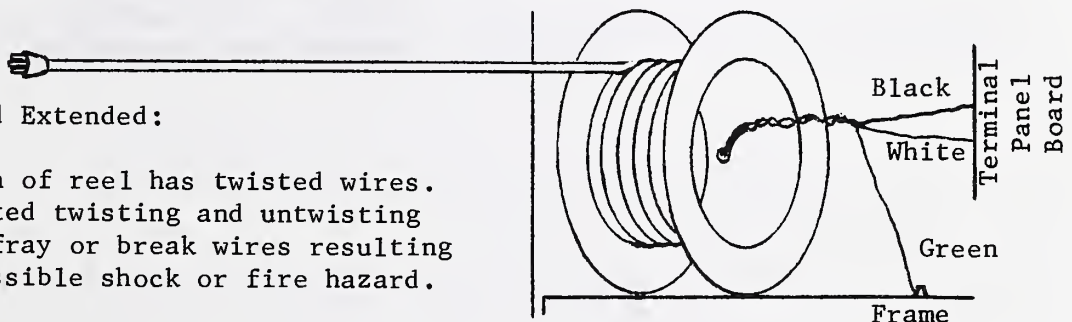
## Power Cord Rolled on Reel:

No twist shows on this simplified diagram of one design used for self-reeling cords.



## Power Cord Extended:

Motion of reel has twisted wires. Repeated twisting and untwisting will fray or break wires resulting in possible shock or fire hazard.



2. The "hot" power wire, in failure, shorts to the neutral wire or to ground; the consequence is a blown fuse, a repair bill at least and a serious fire as a possibility.

3. The green wire breaks; the consequence is not noticed until both an internal short occurs and you furnish a path to ground; the resulting electric shock can be fatal.

If you own or are about to buy an appliance with a self-reeling cord, find out how the reel works. If you find short lengths of wire twisting, as illustrated, you have two ways to avoid early minor repairs and serious safety hazards. Either

1. Don't buy that model, or
2. Have the reel mechanism disengaged.

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## **IT'S ABOUT THAT TIME AGAIN**

The safety topic for October never changes. Countless safety programs across the nation will again place emphasis on fire prevention and protection. Each year, the second week in October is set aside by Presidential proclamation as "Fire Prevention Week." It commemorates those lost in the great Chicago fire and serves as a reminder that with all man's technology and inventiveness, fire disasters and holocausts still plague him.

National Fire Protection Association (NFPA) statistics indicate that fires are killing some 12,000 Americans a year, hospitalizing 50,000 for six weeks or more, and are costing approximately \$11 billion. On-the-job fire hazards must be identified and removed or controlled. The same applies for the off-duty environment. Do you have a home escape plan?

Fires harm everybody. Prevent them!

- 1973 Safety Calendar  
Hercules Incorporated  
Radford Army Ammunition Plant



Here are ten questions that will test your knowledge of safety requirements that you will need under different circumstances. Answers to these questions may be found in the AMCR 385-series and the AMC Supplements to the AR 385-series, and the AR 385-series. How many can you answer without referring to the regulations?

1. What criterion is used to establish the specific classification of Army aircraft mishaps?

Answer and reference:

2. What techniques should be employed when fighting an ammonium nitrate fire?

Answer and reference:

3. At what distance must service magazines be located in regard to explosive operating buildings?

Answer and reference:

4. What is the suggested membership for employees' safety committees?

Answer and reference:

5. How close may gasoline-powered air compressors be located with respect to magazines housing explosives or ammunition?

Answer and reference:

6. Trucks transporting unsymmetrical dimethylhydrazine (UDMH) in a convoy must be separated at what minimum distance?

Answer and reference:

7. What is the required color and marking for safety cans of flammable liquids?

Answer and reference:

8. Under what conditions are guardrails required for scaffolds?

Answer and reference:

9. What precautions must be taken when airline respirators are used?

Answer and reference:

10. What is the storage compatibility group for blasting caps?

Answer and reference:

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## NEW PUBLICATIONS

AR 385-10, Ch 3 25 Apr 73	Safety - Army Safety Program
AR 385-63 28 Feb 73 Ch 1, 23 Apr 73	Safety - Regulations for Firing Ammunition for Training, Target Practice, and Combat
DA Cir 40-2 4 Jun 73	Medical Services - Command Emphasis on Hearing Conservation Programs
DA Cir 385-40 4 May 73	Safety - Precautions for Power Tools with EMI Suppression Circuits
TB 750-261 31 May 73	Instructions for Safe Handling, Maintenance, Storage, and Disposal of Radioactive Items Managed by US Army Weapons Command
SB 740-97-4200 16 May 73	Fire Fighting, Rescue and Safety Equipment
AMCR 40-2 19 Apr 73	Medical Services - Industrial Medical and Hygiene Considerations: Nitroglycerin Operations



## **SAFETY AWARDS**

### **LOUISIANA ARMY AMMUNITION PLANT WINS NSC AWARD OF HONOR**

A National Safety Council Award of Honor was recently presented to Sperry Rand Corporation, operating contractor of Louisiana Army Ammunition Plant, in recognition of the 6,418,797 injury-free man-hours accumulated within their LAP (load/assembly/pack) operations from March 1971 through December 1972.



Shown above with the Award of Honor plaque are, left to right: J. M. Richardson, Sperry Safety Director; E. A. Vihstadt, Sperry Plant General Manager; LTC M. G. Swindler, Commander, Louisiana Army Ammunition Plant; and P. T. Haltom, Chief, COR Safety Office, Louisiana Army Ammunition Plant.

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### **NSC AWARD OF MERIT PRESENTED TO BADGER ARMY AMMUNITION PLANT**

Olin Corporation, operating contractor of Badger Army Ammunition Plant, has received a National Safety Council Award of Merit for operating 4,752,491 man-hours without a disabling injury from December 1971 through

December 1972. Presenting the award was Mr. Robert Sorenson, Membership Service Representative, National Safety Council.



Shown above (left to right) are: J. R. Katic, Operations Manager, Olin Corporation, Badger Army Ammunition Plant; R. Sorenson, National Safety Council; and LTC Phillip D. Thorne, Commander, Badger Army Ammunition Plant.

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## **FRANKFORD ARSENAL WINS GRAND AWARD**

Frankford Arsenal has been honored by the Safety Council of the Greater Philadelphia Chamber of Commerce and the Philadelphia Chapter of the American Society of Safety Engineers with their earning the Grand Award for Inter-Plant Safety Achievement. The Arsenal was chosen as winner of more than 400 competing companies, including DOD and other Government establishments throughout Delaware, South New Jersey, and Southeast Pennsylvania.

The selection of Frankford Arsenal as the award recipient rested largely upon their having worked 435 days (9,700,000 man-hours) without a lost-time injury. This is by far the best safety record achieved in the modern history of Frankford Arsenal.





The award was presented to COL James L. Wallace, Commander, by Mr. M. Chain Robbins (left), Deputy Assistant Secretary of Labor for Occupational Safety and Health, who lauded the Arsenal's enviable safety record. Francis J. Fidell, Safety Director, Frankford Arsenal, is also shown (right) at the ceremony.

## CORNHUSKER ARMY AMMUNITIONS PLANT REACHES ANOTHER SAFETY MILESTONE

A National Safety Council Award of Merit was recently presented to Mason & Hanger-Silas Mason Co., Inc., operating contractor of Cornhusker Army Ammunition Plant. The award was given in recognition of the 2,762,404 man-hours worked without a disabling injury from December 1971 through December 1972.



Shown above at the award ceremony (left to right) are: J. P. O'Dea, Contractor Safety Director; J. M. Higgins, Plant Manager; LTC E. L. Hain, Commander, Cornhusker Army Ammunition Plant; and A. C. Mobley, Chief, COR Safety Office.



## Well, Did you know?

Here are the answers to the questions on pages 19 and 20. A reference to the pertinent regulation and paragraph follows each question.

1. Direct man-hours are used in part to classify aircraft mishaps by incident and major and minor accidents when they are not otherwise classifiable. Direct man-hours are the cumulative (approximate) man-hours required to repair the aircraft and to remove and replace damaged parts. Reference paragraph 2-9a(3), AR 385-40.
2. Fires involving ammonium nitrate should be fought with large quantities of water but never with steam. Solid hose streams enable the fire to be fought from a greater distance but introduce the hazard of steam explosion particularly if the nitrate is molten; therefore, the hose streams must be directed from behind a protective barrier. Under some circumstances where the fire is in the incipient stage and accessible, water fog may be used to advantage but it will have no smothering action since the burning material provides its own oxygen. Reference paragraph 13-16b(3), AMCR 385-100.
3. A service-type magazine shall be located at intraline distance, based on the quantity of explosives within the magazine, from the nearest operating building of the line of which it forms a part. Service-type magazines shall be separated from each other by intraline distances. Reference paragraph 17-5b, AMCR 385-100.
4. Each employees' safety committee should consist of not more than 15 employees. Membership on these committees should be rotated so that each member serves for approximately three months and only a few members are replaced at any one time. Each committee should have a chairman, and a secretary should be appointed by the committee chairman. The safety director or a member of his staff should attend each meeting in an advisory capacity. Reference paragraph 1-13a, AMCR 385-100.



5. Gasoline-engine driven air compressors shall not be parked closer than 50 feet to a magazine in which explosives or ammunition are stored. Reference paragraph 18-9e, AMCR 385-100.
6. Within a convoy, trucks carrying unsymmetrical dimethylhydrazine (UDMH) shall be kept at least 300 feet apart. Reference paragraph 22-9b(3)(d), AMCR 385-100.
7. Safety cans or other portable service-type containers of flammable liquids having a flash point at or below 100°F. or bearing a DOT Red Label will be painted red with a yellow band around the can and/or the name of the contents conspicuously stenciled or painted on the can in yellow. Petroleum product containers used for shipping and storage and issued to TOE units are excluded from this requirement and will be painted olive drab and marked in accordance with MIL-STD-290. Reference paragraph 1-5b, AR 385-30.
8. Securely fastened guardrails and toe boards shall be provided on the outer edges and ends of the platforms of all scaffolds six feet or more above the ground, except for riveters' outrigger scaffolds and window jack scaffolds. Reference paragraph 9-36a, AMCR 385-100.
9. When an airline respirator is used, the following precautions must be taken:
  - a. A trap and filter will be installed in the compressor line ahead of the mask which will separate oil, water, scale, or other extraneous matter from the air stream.
  - b. A pressure regulator is required if the compressor line exceeds 25 psi.
  - c. A pressure relief valve will be provided to operate in the event the regulator fails.

Reference paragraph 10-9, AMCR 385-100.

10. Blasting caps are assigned to storage compatibility group P. Reference Table 19-1, AMCR 385-100.

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## IN MEMORIAM



With the passing of George Landon Feazell on 21 August 1973, the Army Materiel Command marked the loss of a former Director of Safety and the safety career field lost a pioneer and strong advocate.

At the time of his death, Mr. Feazell was the Director of Safety Policy, Office of the Secretary of Defense (Manpower and Reserve Affairs), having been appointed to the newly created post in 1971. Prior to his appointment, he served as Director of Safety for the Army Materiel Command.

A Certified Safety Professional, Mr. Feazell had been directly engaged as a safety engineer in accident prevention for over 25 years.

He was a recognized pioneer in chemical and radiological safety and was credited with developing the specialized safety and health physics techniques and procedures, used in processing uranium. These achievements issued from his service as Safety Director of the gaseous diffusion plants at Oak Ridge, Tennessee, for the Atomic Energy Commission.

Among his other achievements, Mr. Feazell developed and established three "firsts" in specialized safety training. These were: Radiological Safety Course, Fort McClellan, Alabama; the Laser Safety Program, University of Cincinnati; and a Masters Degree, Safety Engineer Program at the AMC Training Center and Texas A&M.

Mr. Feazell also conceived and installed the product safety verification system used throughout USAMC commands to assure safety development in materiel from concept through disposal.

Born and raised in Tennessee, Mr. Feazell majored in Chemistry at King College, Bristol, Tennessee, and received a B.S. in Chemical Engineering from the University of Tennessee. He also taught safety and fire protection at Auburn University, Alabama.

He was a member of the following organizations: Board of Directors, National Safety Council; assistant vice president, American Society of Safety Engineers; delegate, Capitol Chapter, ASSE; vice chairman, Federal Safety Advisory Committee; member, System Safety Society; charter member, Health Physics Society; and, Safety Division Executive Board, American Ordnance Association.















FLARE



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